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10/726,895	12/02/2003	Osamu Kobayashi	GENSP108	4167
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BEYER WEAVER LLP			CEHIC, KENAN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/726,895

Applicant(s)

KOBAYASHI, OSAMU

Examiner

Kenan Cehic

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :04/02/2007, 01/03/2007, 10/25/2006, 10/04/2006, 08/28/2006, 05/15/2006, 04/18/2006, 02/06/2006, 12/05/2005, 09/19/2005, 10/09/2007, 12/18/2007.

DETAILED ACTION

Response to Amendment

1. The amendments Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claim 1-4, 7-10, 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over ENG (US 2007/0140298 A1) in view of Wolf et al (US 6,914,637 B1) and Shay (US 2004/0114607).

For claim 1,7, 13 ENG discloses minimizing buffer requirements prior to commencement of transmission of the data packets from the source device to the destination device over the main link, communicating via the auxiliary channel data packet attributes to the

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destination device (see section 0107 lines 1-3, section 0117 and figure Figure 11, here a bandwidth request for to be sent packets can be sent over a separate channel for transmission; needed bandwidth for transmission is a data packet attribute); forming a reduced size data packet header for each of the data packets wherein the reduced size is commensurate with the data packet attributes already communicated via the auxiliary channel and therefore reduces buffer requirements (see section 0107 lines 1-7, according to the bandwidth request the method can choose a small ("short") packet header, according to the bandwidth request received; it is inherent that buffer requirement is reduced since the packet that are received are smaller); associating the reduced size data packet header with a corresponding one of the data packets (see section 0107 lines 3-7, the size of the header is decided); transmitting the data packet (see Figure 11, reference 1228, packets are transmitted) and associated reduced size data packet header from the source device to the destination device (see section 0107 lines 1-7 and section 0108 lines 10-12, system build the packets according to the method and sends them) over the main link (see Figure 1, reference 402);

ENG does not disclose:

As regarding For claim 1,7, 13 that the destination device is a display device, what kind of system the method is used or interspersing special characters and the main link to maintain synchronization such that neither the main link nor the auxiliary channel include a clock line.

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Wolf et al. from the same or similar field of endeavor teaches a transmission system with the following features:

For claim 1,7, 13, Wolf discloses where the destination device is a display device (see Figure 2, reference 26). Additionally, Wolf teaches a packet based multimedia system having a multimedia source device stream (see Figure 2, reference 13, MPEG-2 are inherently packets of either audio or video) coupled to a multimedia display device (see Figure 2, reference 26 and 27) by way of a bi-directional auxiliary channel (see Figure 2, reference DDC (also note bidirectional arrows), and column 59 lines 30-34 for bidirectional, also note in column 2 Wolf in his definition of a DVI link expressively list the TMDS and DDC channel separately) arranged to transfer information between the display device and a source device and vice versa (see column 59 lines 30-34 and see column 49 lines 18-23) and a unidirectional main link (see column 4 lines 57-66 and Figure 2 CH0-CHC, Wolf specifically defines that TMDS can be one-directional) arranged to carry multimedia data packets (see column 8 lines 9-14, video words are sent (word is generic bundle of data just like a packet) column 14 lines 30-38, for auxiliary data, which can be audio (see column 5, lines 63-67)) from the multimedia source device to the multimedia display device (see column 4 lines 57-66). and interspersing special characters that allow the display device to distinguish each bit of pixel data included in the data (see column 19 lines 1-9, and Figure 5, VSYNC and HSYNC are send in intervals which provides data for each pixel that is sent. Also see Figure 10 and column 42 line 24-32, each pixel clock pulse distinguishes each pixel sent over the TMDS link) hereby requiring only a small (column 19 lines 1-9 vertical and horizontal

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information is sent for each line, containing all the pixel, so that no additional info has to be sent) FIFO type buffer unit (see column 21 lines 41-43, data is buffered). Furthermore, Wolf disclose the main link (see Figure 2, CH0-C) and the auxiliary link (see Figure 2, DDC).

For claim 2, 8 and 14, ENG and Wolf et al. teach all the disclosed invention as previously recited in this paragraph. Additionally, Wolf et al. discloses wherein the data packet is one of a number of associated multimedia data packets (see column 8 lines 9-14, video words are sent (word is generic bundle of data just like a packet) is defined as being data that take together form a multimedia data packet stream (see column 11 lines 37-39, stream is made out of same type of data, see column 7 lines 16-22 and column 8 lines 8-14 for sending of video stream).

For claim 3, 9 and 14 ENG and Wolf et al. teach all the disclosed invention as previously recited in this paragraph. Additionally, Wolf et al. teaches a multimedia data packet stream is one of a number of multimedia data packet streams (see column 13 lines 25-29 and Figure 8 and column 10 lines 35-40) each having an associated adjustable data stream link rate that is independent of the native stream rate (see columns 12 line 63 through column 13 line 25, a clock between the transmitter and receiver is provided so that transmission can happen at the rate of the video/audio stream).

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For claim 4, 10 and 16 ENG and Wolf et al. teach all the disclosed invention as previously recited in this paragraph. Additionally, Wolf discloses a display interface as recited in claim 3, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry display related from the display device to the source device (figure 2 and column 50 lines 33-36) and a uni-directional forward channel included as part of the main link for carrying source related information from the source device to the display device in concert with the back channel (as seen from figure 2 and column 2 lines 31 -36 and column 2 lines 42-49).

Shay from the same or similar field of endeavor disclose an communication system with the following features:

For claim 1,7, 13 Shay discloses a link (see Figure 2, "INPUTS" and see section 0060 lines 1-15 "audio channels") to maintain synchronization (see section 0075 lines 1-11 "recover digital audio synchronization" and section 0096-0097 "clock synchronization recovery....synchronization scheme") such that neither the link (see Figure 2, "INPUTS" and see section 0060 lines 1-15 "audio channels") nor another channel (see section 0024 lines 1-5 "links") include a clock line (see section 0075 lines 1-11 "recover digital audio synchronization....statistical filtering of received timestamped clock information packets" and section 0096-0097 "clock synchronization recovery....synchronization scheme....timestamped clock references").

Thus it would have been obvious to a person of ordinary skill to combine the method of sending packet transmission characteristics to a second device, in order to reduce packet header size. One could have implemented the sending of a bandwidth request (as taught by ENG) to either the transmitter or receiver (see Figure 2, 1' and 2' as taught by Wolf) via the bidirectional DDC link. The sending of the bandwidth request could be implemented, via embedded software, by the microcontrollers 15 and/or 25. The formation of the reduced packet header as taught by ENG could implement in 106 and/or 108 subsystem of the transmitter as taught by Wolf et al in figure 13. This could have been done by either additional hardware or control software in the, when the video/audio data is formatted for transmission, (see in figure 13, especially "Aux packet muxing" and "HDCP masking"). The microcontroller and those two subsystems could have worked in coordination to implement the packet header reduction via the "Serial Host Interface" as shown in Figure 13 of Wolf et al.

The motivation for claim 1, 7, and 13 is that according to the data transfer characteristics, one can increase the payload of a packet, since the packet header size is reduced. This obviously improves transfer capacity per packet. Furthermore, one can use that extra space for additional control data, such as priority.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of ENG and Wolf by using the features, as taught by Shay, so that less physical means (wire etc) needs to be used which reduces the cost of network/interface infrastructure (see column 2 lines 65-67), since no separate line is

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needed to provide the clock and in order to account for any propagation delay between the source and destination.

The motivation for claim 2, 8 and 14 is that if we have the reduced packet header we are able to have large packets and thus the many packets that make up the multimedia stream also are able to carry more information then if they did not have the reduced packet headers. This improves quality of service, where an isochronous stream (such as video) is needed. All the needed data is delivered at the correct timing, thereby preserving an almost real time delivery. Additionally, in that extra space it is known that priority data could be inserted into the packet, which is also important for multimedia content.

The motivation for claim 3, 9, 15 is that if we have the reduced packet header we are able to have large packets and thus the many packets that make up the multimedia stream also are able to carry more information then if they did not have the reduced packet headers. This improves quality of service, where an isochronous stream (such as video) is needed. All the needed data is delivered at the correct timing, thereby preserving an almost real time delivery. Additionally, in that extra space it is known that priority data could be inserted into the packet, which is also important for multimedia content. Being able to transmit data at different rates is beneficial for different data types like video and audio (see column 13 lines 17-25). Thus we can transmit each different type of stream at its original rate, and thus not distorting it.

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The motivation for 4, 10 and 16 is to have the bi-directional channel made out of two unidirectional channels is to have full-duplex communication. With having full duplex communication and the reduced header we are able to communicate, possibly time crucial information, in both directions at the same time.

5. Claim 5, 6, 11, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over ENG (US 2007/0140298 A1) and Wolf et al (US 6,914,637 B1) and as applied to claim 1-4, 7-10, and 13-16 above, and further in view of Fuhrman (5,745,837):

For claim 5, 11, and 17 ENG and Wolf et al recites all the claimed limitation as described in paragraph 4. Wolf does not teach that the main link is consisting of virtual links. Fuhrmann from the same or similar field of endeavor teaches a number of virtual links (see column 38 lines 6-8, each CPE is connected via virtual link) each being associated with a particular one of the multimedia data packet streams (see column 36, lines 13-18, lines 25-28 ATM transports multimedia content in) wherein each of said virtual links has an associated virtual link bandwidth (see column 3 lines 46-55, the bandwidth for the virtual links, of each CPE, is allocated) and a virtual link rate (see column 56 lines 27-29 the rate of each virtual link is counted, see also column 49 line 60 to column 50 line 7, each CPE can have a varieties of rates and each CPE is connected via a virtual link). Thus it would have been obvious to a person of ordinary skill at the time the invention was made to incorporate the virtual link structure into the communication system as taught by Wolf et al. The virtual link architecture is an abstract idea thus it could have been

implemented in the microcontroller of the source device (see Wolf et al. Figure 2, reference 15) via software. Thus one is able to implement the virtual link architecture into the system of Wolf et al. The motivation is that one is able to divide the single physical channel, in an organized manner to different source devices. Thus one can control how much bandwidth each source device gets.

For claim 6, 12, 18 Wolf, Fuhrmann teach the claimed invention as in claim 5, 11, and 17. Wolf does not teach where the virtual link bandwidths are less of equal to the main link bandwidth. Fuhrmann from the same or similar field of endeavor wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths (see Figure 45A and 45B, reference sign 1150, we can have a case where the total number of CPE connections through virtual links is equal of less to the total available channels). Thus it would have been obvious to a person of ordinary skill at the time the invention was made to incorporate a network control that makes sure that the virtual links bandwidth does not exceed the main link bandwidth. One would have been able to implement the method shown in Figure 45A and 45B of Fuhrmann via software in the microcontroller (shown in Figure 2) of Wolf. The motivation is that one needs such a control mechanism in order to allocate bandwidth to stream when there is no available bandwidth left.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Kim et al. (6,151,334)
- b. Rabenko et al. (US 6,765,931 B1)
- c. Kou et al. (6,154,225)

The above-cited references are to show various video stream interfaces

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenan Cehic whose telephone number is (571) 270-3120. The examiner can normally be reached on Monday through Friday 7:30AM to 5:00PM (EST). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dang Ton can be reached on (571) 272-3171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KC

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'KB Yao', is written below the printed name and title.